

CALIFORNIA DIVISION OF MINES AND GEOLOGY
FAULT EVALUATION REPORT FER-245
SUPPLEMENT No.1

**SILVER STRAND FAULT, CORONADO FAULT, SPANISH BIGHT FAULT,
SAN DIEGO FAULT and DOWNTOWN GRABEN**
Southern Rose Canyon Fault Zone
San Diego, California

by
Jerome A. Treiman
April 22, 2003

The purpose of this supplement is to respond to comments received during the official review period for the proposed Earthquake Fault Zone revisions recommended in Fault Evaluation Report 245 (Treiman, 2002) and portrayed on the Preliminary Review map of the Point Loma quadrangle released on November 1, 2002. Relevant to this proposed zoning, we received three communications through the State Mining and Geology Board, as summarized on Table 1. In addition we received one further communication from the Port of San Diego (copy attached as Appendix A) and a report by Robert Prater Associates (2000) regarding a small fault in the downtown graben. Affected areas are indexed on Figure 1.

Spanish Bight fault

With respect to this fault we received two communications. From URS we received a copy of a report (URS, 1998) that they prepared for the Naval Facilities Engineering Command. This report included submarine geophysical data and interpretations that bear on the location of the subject fault zone at a proposed naval facility on North Island. This data was reviewed in our initial evaluation. Figure 2 of this supplement shows the locations of faults defined at the 100 millisecond depth and also shows the faults interpreted by Kennedy and Clarke (1999) at depths as shallow as 5-10 milliseconds. It was these shallower data that were used to define the proposed EFZ and are believed by us to be a better approximation of a surface trace of this fault. Also shown are older data from Kennedy and Welay (1980), which are not as accurately located. **No change is recommended for this fault location.**

Additionally, in their cover letter, URS suggests that a northeast-trending branch fault might also be reconsidered (based on data from a 1994 marine geophysical survey by Woodward-Clyde, 1994). This fault is similar to that shown by Kennedy and Welay (1980). However, since the reinterpretation of this fault, as mapped by Kennedy and Clarke (1999), does not project onto land, it was not considered for EFZ designation. EFZ designation is intended to protect onshore structures and is generally extended offshore only where there are onshore faults to which they are connected.

The Port of San Diego (2003a, b -- see Appendix A) has suggested that the northern trace of this fault be truncated before it crosses Harbor Island, based on a lack of data presented to justify the extension across Harbor Island. A review of available information finds that we neglected to consider data from the published map of Kennedy and Welday (1980). Their map depicted the extension of this fault, north of Harbor Island, based upon two high-resolution reflection profile crossings (tracklines partially shown on Figure 2). This data was not part of the newer data set of Kennedy and Clarke (1999) and hence was overlooked in our evaluation. Other geophysical track lines from the earlier study, as well as several lines from Kennedy and Clarke (1999) helped delineate the fault from the south to within a few hundred meters of Harbor Island. The addition of the earlier data to the recent body of work provides evidence that the northern extent of the Spanish Bight fault appears to cross the eastern tip of Harbor Island and **warrants extending this proposed zone several hundred feet further north** (see Figure 2). For the fault location, preference was given to the newer data because the use of a high-precision differential Global Positioning System south of Harbor Island provided meter-level location accuracy (Kennedy and Clarke, 1999).

Coronado fault

Shannon & Wilson, Inc. (2003), on behalf of Sharp Coronado Hospital, has submitted the results of subsurface investigations made by URS (2000) with a request that we modify the proposed zone so as to exclude the hospital property. Although this request was not submitted by a registered geologist, the report, prepared by a geologist, contains some relevant information. A line of CPT borings along 3rd St. provides evidence of general continuity of alluvial units beneath the site. The resolution of the data is such as to preclude any major fault breaks beneath the site, but does not eliminate the possibility of minor breaks. Additionally, the CPT borings do not extend the full width of the site, as shown on Figure 3. On the other hand, the proposed zone is a little wider at the hospital site than elsewhere, due to the locations selected for the turning points. A turning point could be selected one block south of the hospital (on 4th St.) to make the zone width more even. By also centering the next turning point north within the intersection of 1st St. and A St. the revised zone will leave that portion of the hospital site that was explored by CPT out of the zone. It seems quite unlikely that the Coronado fault, which appears to be stepping left in this vicinity, would have any splays extending this far east. Therefore **I suggest slightly narrowing the proposed zone in this location.**

Additionally, the Port of San Diego (Appendix A) recommended deletion of two queried fault segments where this fault trends offshore, north of Coronado. Inasmuch as the portrayed faults are dotted and queried it should be understood that the fault lines on the map are not intended to represent a precise fault location. Rather, these are to indicate that a fault, on which the zone is based, lies in this general vicinity. Hence it would be confusing and unnecessary to delete these lines from the map, and **no changes are recommended.**

Silver Strand fault and downtown graben

The Port of San Diego (2003a, b) was concerned with the portrayal of faults in the shoreline area, south of downtown San Diego, although they were in support of the zone, itself. Inasmuch as the portrayed faults are dotted and queried it should be understood that the fault lines on the map are not intended to represent a precise fault location. Rather, these are to indicate that a fault, on which the zone is based, lies in this general vicinity. Hence it would be confusing and unnecessary to delete these lines from the map, and such action is not recommended.

A report by Robert Prater Associates (2000) was sent to us by Geocon, Inc. with a request that the small fault (informally referred to as the Leritz fault by Prater Associates) be deleted from the Official EFZ map. The report provides evidence that the Leritz fault south of C Street, near 15th (see figure 4) is not active. This short fault trace had previously been reported as possibly active, based on preliminary studies by consultants (W. Landry, personal communication, July 1999). Prater Associates excavated 5 trenches across the Leritz fault and exposed a west-dipping normal fault that offsets Plio-Pleistocene San Diego Formation and overlying Pleistocene terrace deposits. Trenches 1A and 1B exposed a well-developed argillic B soil horizon (their S₃ unit) that is clearly not offset by the Leritz fault. They estimated the age of the S₃ unit to be between 53 ka and 156 ka, based on soil profile development. Based on the recently submitted data I **recommend that the short fault trace indicated on Figure 4 be removed from the zone map, but there should be no change to the EFZ boundaries.**

San Diego fault

No additional data or comments were received and **no changes are necessary** to the proposed zoning.

4/24/03
Report reviewed
& approved.
William A. Treiman
CEG 1554



Jerome A. Treiman
Geologist EG1035

References

- Kennedy, M.P., and Clarke, S.H., 1999a, Analysis of late Quaternary faulting in San Diego Bay and hazard to the Coronado Bridge: California Department of Conservation, Division of Mines and Geology Open-File Report 97-10A.
- Kennedy, M.P., and Welday, E.E., 1980, Character and recency of faulting offshore, metropolitan San Diego, California: California Division of Mines and Geology Map Sheet 40, 1:50,000.
- Port of San Diego, 2003a, Technical review comments, preliminary review map - Earthquake Fault Zones - Point Loma quadrangle release November 1, 2002: letter from Port of San Diego dated January 31, 2003, 1p. plus map.
- Port of San Diego, 2003b, letter from Port of San Diego dated February 14, 2003, 2p. plus map [included in this supplement as Appendix A]
- Robert Prater Associates, 2000, Fault investigation for 14th & Broadway - East Village, San Diego, California: unpublished consultants report, May 31, 2000 (P.N. 579-1, 00-152).;
- Shannon & Wilson, Inc., 2003, Preliminary review map of proposed Earthquake Fault Zones of November 1, 2002, for affected cities and counties, Coronado, California: letter dated January 23, 2002 accompanying submittal of URS (2000) cited below, 5p.
- Treiman, J.A., 2002, Silver Strand fault, Coronado fault, Spanish Bight fault, San Diego fault and downtown graben: California Geological Survey, Fault Evaluation Report FER-245, 13p., maps various scales.
- URS, 1998, Additional fault hazard investigation, CVN berthing wharf – Phase II (P-700A), Naval Air Station, North Island, Coronado, California: unpublished consultants report, Project Number 589751124H00-OEQ01, August 7, 1998, rev. December 16, 1998.
- URS, 2000, Seismic hazard investigation for seismic retrofit evaluation, Sharp Coronado hospital, Coronado, California: unpublished consultant report dated June 30, 2000 (PN. 58-00011034.01 - MGE01).
- Woodward-Clyde, 1994, Seismic hazards assessment, proposed Nimitz class aircraft carrier homeporting project, Naval Air Station, North Island, Coronado, California: unpublished consultants report dated May 11, 1994 (P.N. 9351143H-EQ01).

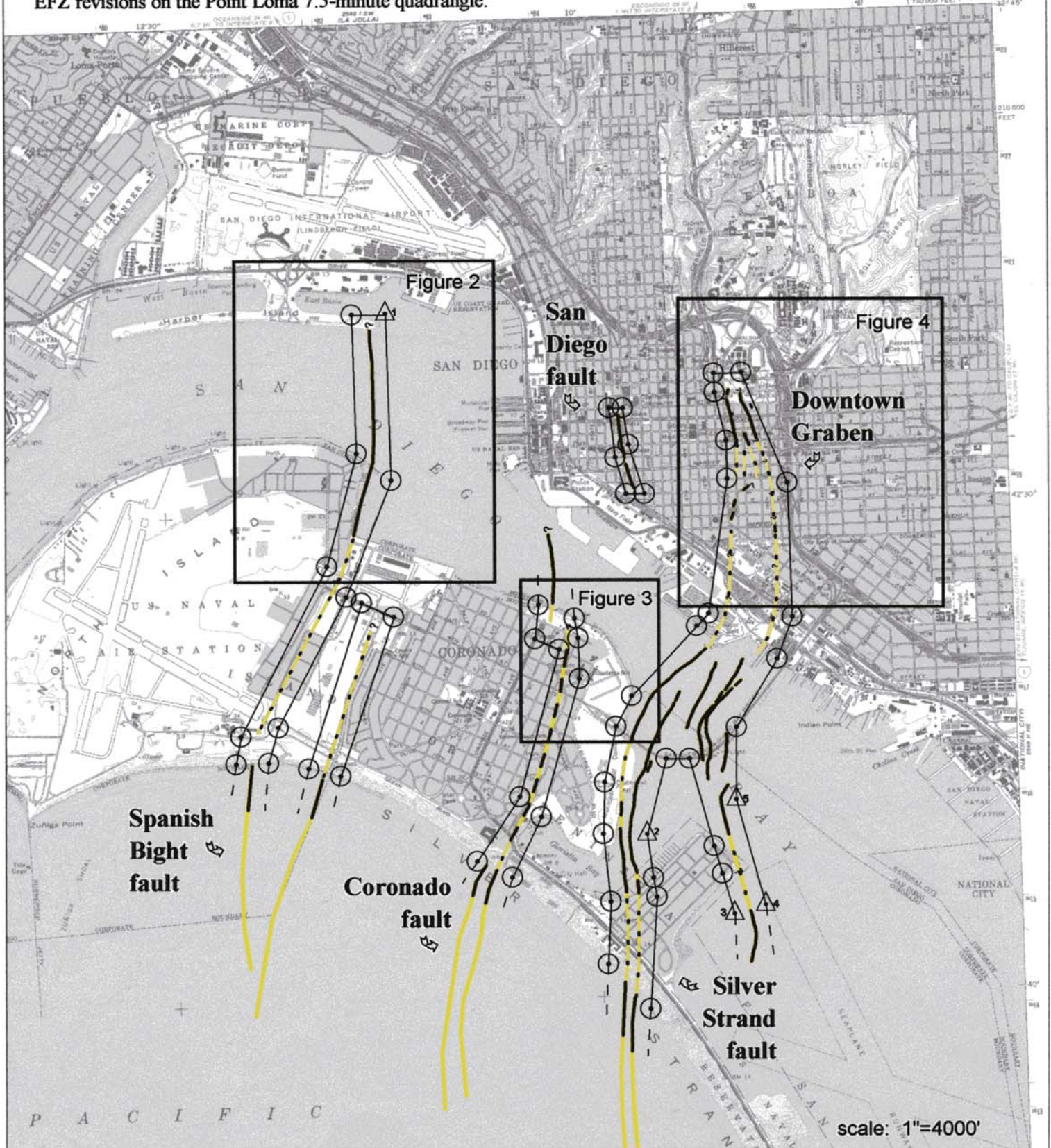
Table 1**Review comments received, 11/1/02 Preliminary APEFZ Map Release**

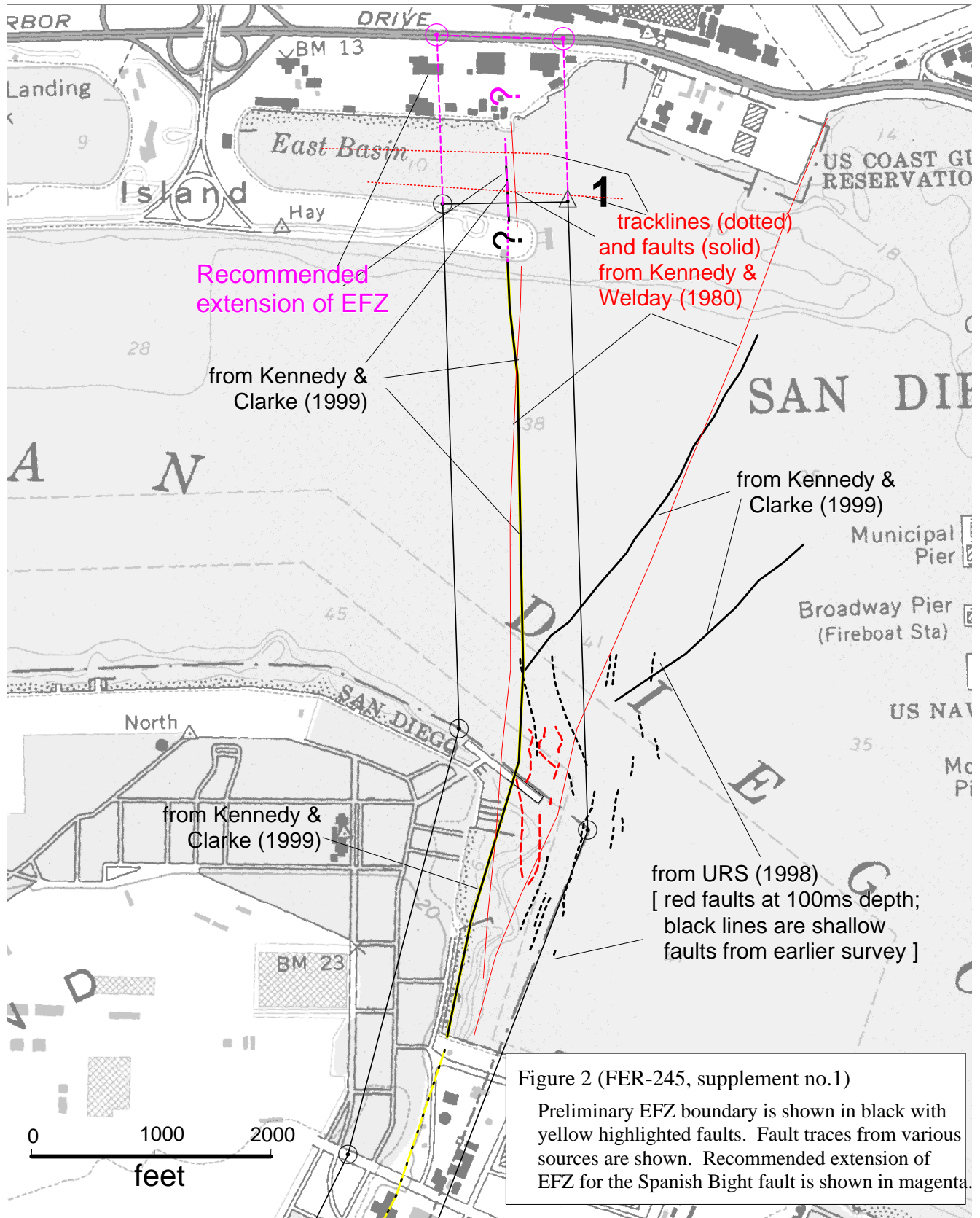
Comment Letter Date	<u>From</u>	<u>APEFZ Map</u>	<u>Comments</u>
1/27/03	David Schug, URS, with attached consulting report for US Navy, titled "Additional fault hazard investigation, CVN berthing wharf, Phase II (P-700A), Naval Air Station North Island, Coronado, CA," December 16, 1998, URS project no.589751124H00-0EQ01	Point Loma	Report utilized offshore geophysical survey in San Diego Bay and identified strands of the Spanish Bight fault. Location of fault is very close to the proposed AP zone, but the location is at 100 ms depth (about 100m) and fault is depicted as dipping to the east, which would indicate that up-dip surface projection could place surface trace to the west of the zoned fault. It is not known how well-constrained the fault is above the 100 ms depth. URS concluded that the fault probably offsets Holocene deposits.
1/31/03	Letter from Javier Saunders, Port of San Diego, asking for extension of review period to comment on faults that affect Port of San Diego's jurisdiction.	Point Loma	Spoke with Mr. Saunders and sent letter and copy of FER-245 with deadline to receive review comments (postmarked 2/15/03). They are concerned about supporting data for Spanish Bight fault where it approaches Harbor Island, and parts of the Silver Strand fault extending onto wharfs.
12/31/02	Franck Glick, DWR	na	No comments.
1/23/03	Christopher Robertson, Shannon & Wilson, with attached consulting report, titled "Seismic hazard investigation for seismic retrofit evaluation, Sharp Coronado Hospital, Coronado, CA, dated June 30, 2000, URS project no. 58-00011034.01 – MGTE01.	Point Loma	Based on cpt investigation for Coronado Hospital, URS determined that Coronado fault is located west of Coronado Hospital. They are requesting that AP EFZ be modified to not include the hospital. Hospital is located at the eastern edge of the APEFZ.

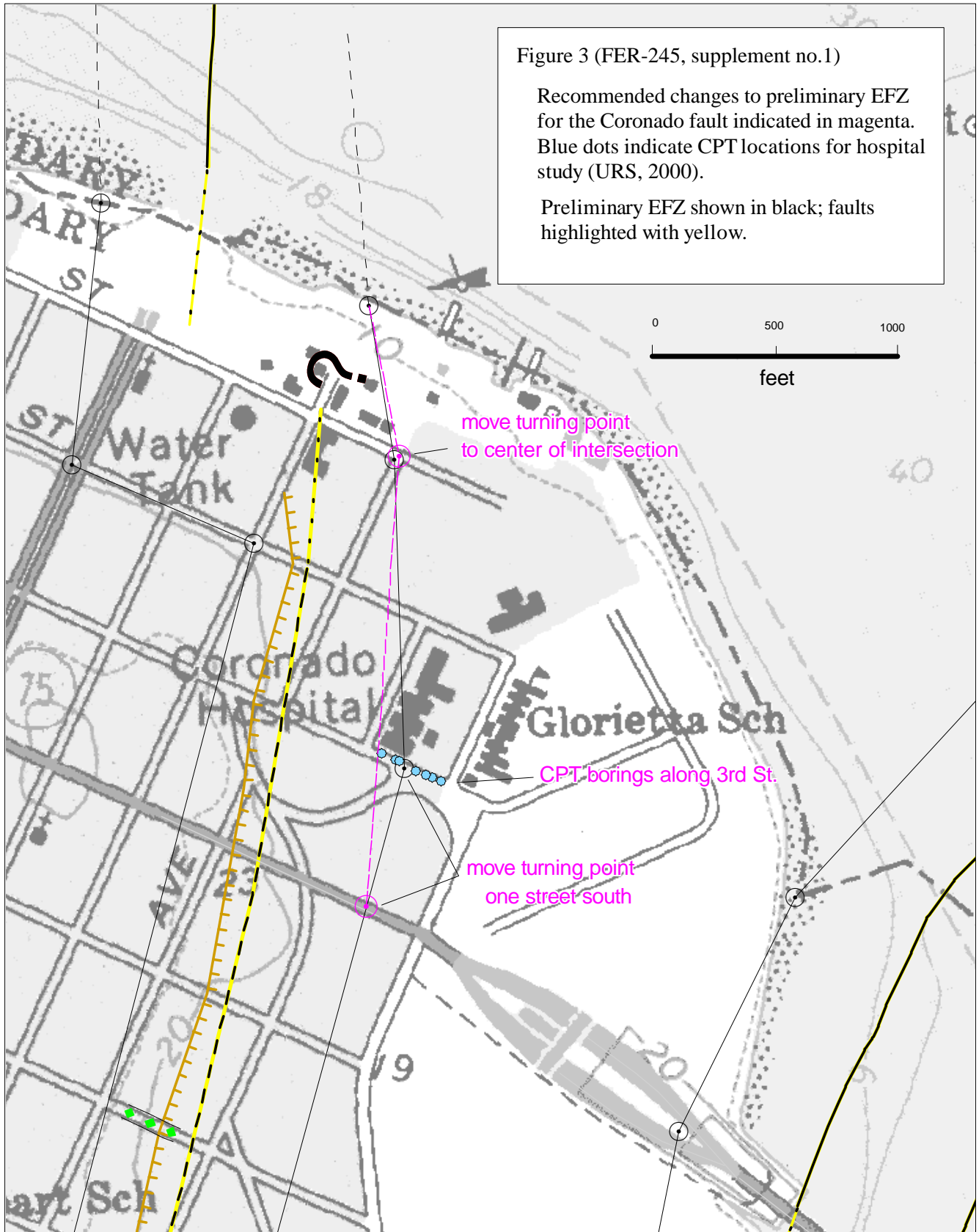
Figure 1 (FER-245, supplement no.1)

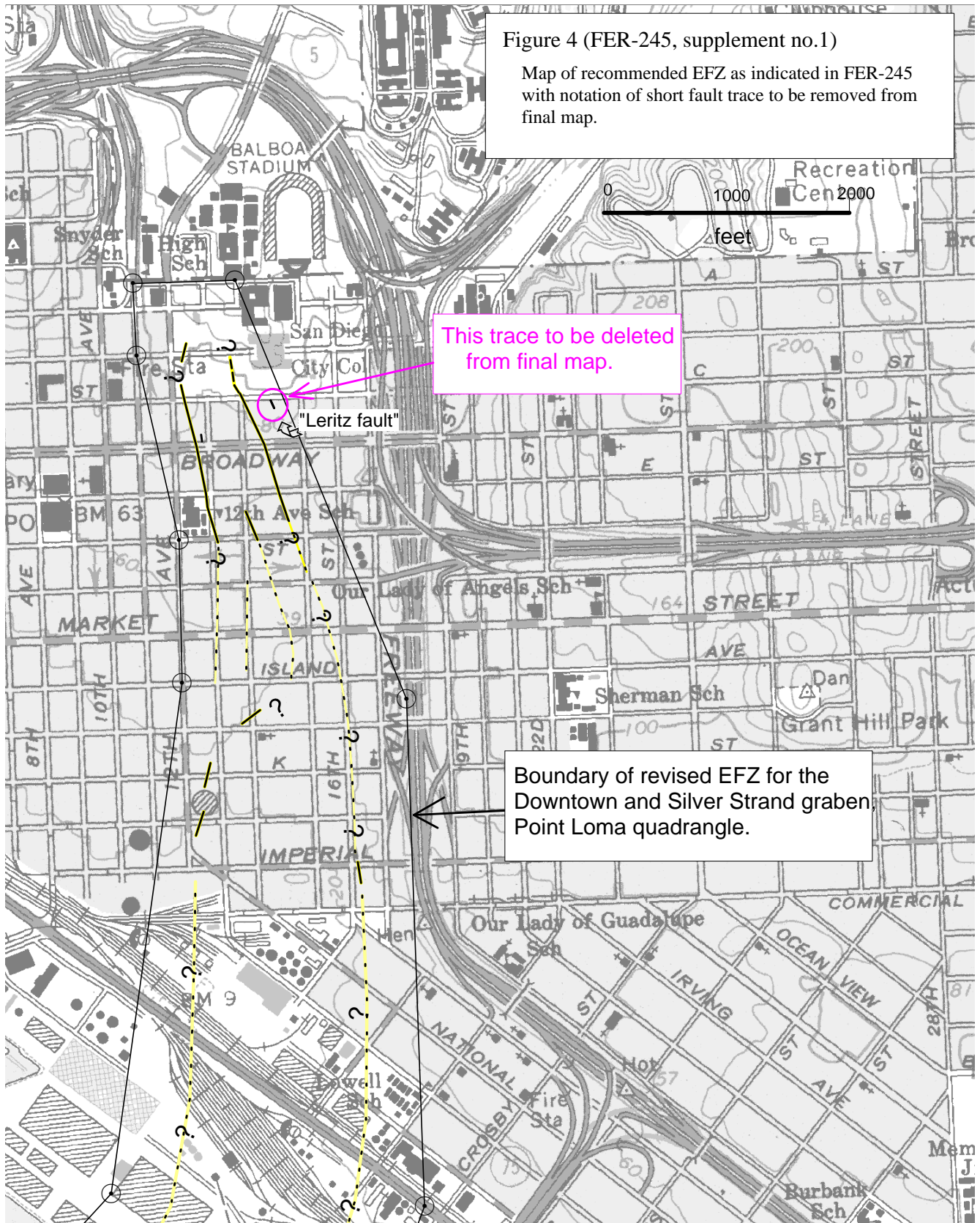
Index to areas for which comments were received relative to proposed EFZ revisions on the Point Loma 7.5-minute quadrangle.

POINT LOMA QUADRANGLE
CALIFORNIA-SAN DIEGO CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)











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and Lindbergh Field Air Terminal

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February 14, 2003

Mr. William A. Bryant
California Geological Survey
801 K Street, MS 12-32
Sacramento, CA 95814

Dear Mr. Bryant:

Thank you for submitting to us a copy of Fault Evaluation Report FER-245. Staff along with our geotechnical consultant reviewed the report and following are our comments.

As a major owner of properties located adjacent to San Diego Bay, the Port of San Diego may be significantly impacted by the New Earthquake Fault Zones proposed by the subject map. The queried faults shown at the marine terminal and portions of Coronado are intended to show continuity of faults identified upland and within San Diego Bay. The locations of the queried faults are not based on site-specific data, but based on inferred continuity of similar faults. As we understand, these queried fault traces are not intended to represent a well defined location. Therefore it is requested that these queried fault traces be removed until more specific data is available. See attached map. We however concur that those areas should remain within the Earthquake Fault Zone Boundaries.

Secondly, a small portion of Harbor Island is located within the Earthquake Fault Zone Boundary. It is suggested that the queried fault end at the last documented location. The extension of the Fault Boundary within Harbor Island is unsupported by field information. It is requested that the State review the extension and end the fault Boundary based on actual field data.

Mr. William A. Bryant

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Once again, thank you for the opportunity to comment on the Fault Report FER-245. We look forward to the release of the updated map. Should you have any questions please feel free to call me at 619-686-6246.

Sincerely,



E. Javier Saunders
Assistant Director, Engineering-Design

cws

Faxed

Attachment

Cc: Tony Heinrichs
Dan Strum
Stan Westover
Melissa Mailander

